

NON-PUBLIC?: N
ACCESSION #: 9204270457
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Peach Bottom Atomic Power Station- PAGE: 1 OF 5
Unit 2

DOCKET NUMBER: 05000277

TITLE: Engineered Safety Feature Actuations as a Result of Pulling the
Incorrect Fuse and Two Component Failures
EVENT DATE: 08/05/91 LER #: 91-028-01 REPORT DATE: 04/16/92

OTHER FACILITIES INVOLVED:
DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 098

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Albert A. Fulvio, Regulatory TELEPHONE: (717) 456-7014
Supervisor

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On 8/5/91 at 1432 hours, a trip of an emergency bus breaker caused an automatic 4 KV fast transfer which resulted in a Primary Containment Isolation System (PCIS) half Group 1, Group II, and Group III isolations. At 1510 hours, a reactor scram occurred due to a turbine trip from moisture separator high level which resulted in PCIS Group II/III isolations. The scram and isolations were reset and the affected systems were restored to normal. The cause of the event has been determined to be that an Electrician pulled an incorrect fuse during Preventive Maintenance activities. The 'D' moisture separator dump valve failed closed due to a positioner failure. The event has been discussed with the involved individuals and the pertinent information has been provided to the appropriate personnel. The failed components have been repaired

and the Preventive Maintenance activities have been reviewed and revised as necessary. No actual safety consequences occurred as a result of this event. One previous similar LER was identified.

END OF ABSTRACT

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Requirements for the Report

This report is submitted to satisfy the requirements of 10 CFR 50.73(a)(2)(iv) because of unplanned Engineered Safety Feature (Reactor Protection System {RPS} {EIIS:JC} and Primary Containment Isolation System {PCIS} {EIIS:JM}) Actuations.

Unit Conditions at Time of Event

Unit 2 was in the RUN mode at 98% of rated thermal reactor (EIIS:RPV) power. There were no other systems, structures, or components that were inoperable that contributed to the event.

Description of Event

On 8/5/91 at 1432 hours, a trip of an emergency bus breaker (E-322) (EIIS:BKR) caused an automatic 4 KV fast transfer. This trip was caused when a Maintenance Electrician pulled an incorrect fuse (EIIS:FU) during Preventive Maintenance (PM) activities. The 4KV fast transfer caused a power interruption to electrical distribution panels (EIIS:PNL) which resulted in a PCIS Group II Reactor Water Cleanup (EIIS:CE) isolation and a "B" Feedwater heater string isolation. Additionally, a half scram signal and a PCIS half Group I and half Group III isolation occurred when the 2B RPS Motor Generator (M/G) set tripped during the fast transfer. This caused the Standby Gas Treatment System (EIIS:BH) to initiate and the Reactor Building ventilation systems to trip. The half scram actuation and PCIS isolations were reset after the event and all systems were restored to normal.

At 1510 hours, a reactor scram occurred due to Turbine Stop Valve (EIIS:V) fast closure which was caused by a Main Turbine "D" Moisture Separator Drain Tank (MSDT)(EIIS:TX) high water level trip. The MSDT high level trip caused a turbine trip which initiated a Generator (EIIS:GEN) Lock Out. A PCIS Group II/III isolation occurred as expected due to Reactor water level decrease after the scram. Level was immediately restored using the 2C Reactor Feed Pump (EIIS:P). The scram actuation and PCIS Group II/III isolation were reset after the event and all systems were restored to normal. The NRC was notified of the event

via ENS at 1648 hours.

Cause of Event

The causes of the events have been determined to be the following:

4KV BREAKER TRIP:

A Maintenance Electrician (Utility, non-licensed) pulled an incorrect fuse during PM activities which caused the automatic 4KV fast transfer of one Emergency bus. The Electrician was attempting to pull the elevator fuse. These fuses were normally removed by the electricians when performing the task as an extra safety precaution. Removal of the fuse was not specifically required to perform the task. The PM task was to adjust the 4KV breaker elevator mechanism and to clean the 4KV cubicle. Pulling the incorrect fuse has been attributed to the individuals' failure to self check. A contributing factor to this event was that the fuse label was less than adequate since it was not visible to the

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electrician and this label's location was different than the other fuse labels in the cubicles. Additionally, fuse arrangements in this cubicle were different than in the other cubicles.

Several other factors which contributed to the incorrect fuse removal have been identified. Although the procedure for the job contained a general caution that disturbing energized components could cause a breaker trip, the caution was too general and did not provide an effective barrier to this event. The Electrician who removed the fuse was not aware that certain fuse blocks were energized and that removal of these fuses blocks could cause a breaker trip. A pre-job briefing and walkdown were not held prior to work since the work was considered to be routine. The Job Leader who was aware of the different fuse configuration in the 4KV cubicle had not informed the electrician of the difference and had momentarily left the breaker cubicle when the fuse was pulled.

RPS M/G Set Trip:

Additionally, the 4KV fast transfer caused the '2B' RPS M/G set to trip. Initial investigation after the scram indicated that the trip occurred when the undervoltage relay in the M/G set start circuit timed out prior to the load center re-energization.

TURBINE TRIP:

The Turbine trip due to MSDT high water level was the result of several factors.

Operations had difficulty during the attempt to restore 'B' feedwater heaters to service after the loss of extraction steam since no procedures existed for the recovery from a feedwater heater isolation. Additionally, insufficient training for recovery after a feedwater heater isolation had been provided to the licensed operators. Shortly after the 'B' feedwater heater isolation was restored, the '3B' and '4B' heaters isolated on heater high water level. The extraction steam valves were re-opened, however the 'D' and 'E' moisture separator motor operated drain valves which automatically isolate on heater high level were inadvertently left in the closed position due to lack of procedural guidance. With these drain valves isolated, the 'D' and 'E' moisture separators were required to control MSDT level by dumping to the main condenser through their dump valves.

Subsequently, the 'D' moisture separator dump valve failed closed due to an unexpected positioner failure. An inspection of the dump valve identified that a positioner lock nut fell off which caused valve closure. When the dump valve failed closed, the 'D' moisture separator level increased due to no drainage path and caused a main turbine trip.

No moisture separator high water level alarm was received prior to the turbine trip due to failure of the alarm level switch. The level switch was found defective after the trip. If the alarm had operated as designed, the operators would have likely been provided time to assess the situation and take corrective

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actions as directed by the alarm response card. It has been determined that no PM task existed which verified level switch operation on a periodic frequency.

Analysis of Event

No actual safety consequences occurred as a result of this event. All automatic isolations, initiations, and transfers functioned as designed.

Corrective Action

Following the event, the scram and isolations were reset and the affected systems were restored to normal.

The event has been discussed with the involved Maintenance Electricians and supervision. Maintenance personnel team meetings have been conducted to emphasize the importance of Job Leader Supervision during the work evolution. Additionally, the importance of pre-job briefings and walkdowns of components and systems prior to start of work has been emphasized. Maintenance procedures for this PM task have been revised to add a specific precaution to identify which breaker cubicles contain energized circuits and which fuses should not be removed. Additionally, warning labels have been applied at fuses in the 4KV cubicles where the fuses affect equipment other than that fed by the breaker in the cubicle.

The pertinent information from this event has been provided to the appropriate Operations personnel and members of the technical staff.

An operating procedure has been developed to provide direction in the event of a feedwater heater isolation which included the reopening of the moisture separator drain valves. Task Analysis has been performed on the feedwater heater system operations and recovery from isolations which determined what additional Operations training is required. Additionally, a review of other transient procedures has been performed. One additional recovery procedure was identified as being needed. This condition will be evaluated and appropriate procedures will be generated as necessary.

Engineering is evaluating the design of the RPS M/G set undervoltage time delay relay to determine if the time delay can be increased to ensure continued operation of the M/G set after a 4KV fast transfer.

The 'D' moisture separator dump valve positioner was repaired and adhesive was added to the lock nut. The positioners for the other Unit 2 moisture separator dump valves were inspected and adhesive was added to prevent recurrence. The inspection identified that the 'E' dump valve also had a loose positioner nut which was similarly repaired. Additionally, the Unit 3 dump valve positioner lock nuts have been verified to be satisfactorily installed and adhesive was applied as a precaution. The PM tasks on these valves have been evaluated which determined that the type of maintenance and the frequency are adequate to prevent future occurrences.

The 'D' moisture separator Hi-Level alarm switch has been repaired. Other Unit 2 and the Unit 3 Hi-Level alarm switches will be tested for proper operation during a future outage. Additionally, a PM task has been initiated to routinely verify level switch operation.

Previous Similar Events

No previous similar LERs have been identified involving maintenance personnel removing the incorrect fuse which initiated an ESF actuation. One previous similar LER (LER 2-86-001) was identified involving scrams caused by MSDT high levels. As a result of this event, the corrective actions taken repaired the air supply line to a drain valve only. Therefore this corrective action could not have been expected to prevent this event.

ATTACHMENT 1 TO 9204270457 PAGE 1 OF 1

CCN 92-14051 PHILADELPHIA ELECTRIC COMPANY
PEACH BOTTOM ATOMIC POWER STATION
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KEN POWERS
PLANT MANAGER

April 16, 1992

Docket No. 50-277

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: Licensee Event Report
Peach Bottom Atomic Power Station - Unit 2

This LER concerns Engineered Safety Feature actuations as a result of pulling an incorrect fuse and failure to restore a system to its normal configuration in conjunction with component failures. This revision provides updated information involving the event cause and corrective actions.

Reference: Docket No. 50-277
Report Number: 2-91-028
Revision Number: 01

Event Date: 08/05/91
Report Date: 04/16/92
Facility: Peach Bottom Atomic Power Station
RD 1, Box 208, Delta, PA 17314

This LER is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(iv).

Sincerely,

cc: J. J. Lyash, USNRC Senior Resident Inspector
T. T. Martin, USNRC, Region I

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